METHOD FOR SETTING A STONE IN A METAL ELEMENT

The present invention relates to a method for setting a stone in a metal part.

In the jewelry and horological field, the setting of precious stones in metal parts is well known.

In one conventional method, an operator applies a graver obliquely to the surface of a piece of metal to deform it. This causes the metal to deform to produce a collar that covers the periphery of the stone and immobilizes it in the metal element.

This method is satisfactory except for the fact that the deformation of the metal can cause burring, which detracts from the smoothness of the resulting piece of jewelry.

Another drawback with this method is that it can be used to set stones only in metals such as gold or silver, that is metals having a certain ductility. If instead the method is applied to hard metals, such as titanium, it is found that the action of the graver acting obliquely to the surface of the piece of metal does not produce a collar because the metal breaks and forms a chip.

Another drawback with the current setting method has to do with the fact that, in the case of pavé settings, meaning many stones set side by side over the surface of a piece of jewelry or a watch, the area of metal bounded by the stones appears dull and does not contribute to setting off the stones.

It is therefore an object of the invention to provide a method for setting stones in a piece of hard metal such as titanium.

It is another object of the invention to provide a method of setting that displays the stones to advantage.

According to the invention, this method for setting at least one stone having a girdle in a piece of metal, said method comprising the following steps:

- at least one hole is pierced in the piece of metal for receiving the stone,
- a stone is placed in each hole,
- a tool is applied perpendicularly to the surface of the piece of metal and close to the periphery of each hole, the end of said tool having a tip for pushing back a lip of metal onto the girdle of the stone, and forming at least one indentation comprising at least one light-reflecting facet.

The method according to the invention therefore makes it possible to set pieces in an extremely hard metal because of the perpendicular action of a tool in deforming the metal and forming a lip. What is more, the indentation forming a lip has at least one facet, giving the setting according to the invention additional visual appeal.

In one possible version the tool is applied manually.

In another possible version the tool is applied mechanically.

The invention also relates to a tool for carrying out the method, having at its end at least one surface ending in a tip.

In accordance with several shapes which the tool may take:

- the tool has at its end a conical form ending in a tip;

- the tool has at its end a tetrahedral form ending in a tip;
- the tool has at its end several facets converging toward a tip;
- the tool has a radius of 0.2 to 0.5 mm.

The invention also relates to the product such as a jewel or timekeeper comprising a piece of metal on which is placed at least one stone having a girdle, said product being characterized in that it exhibits, around at least one stone, at least one indentation having a facet impressed into the surface of the piece of metal, forming a lip that covers the girdle of the stone.

Preferably the entire surface of the piece of metal bounded by two or more stones is impressed with indentations.

In order that it may be understood clearly, the invention is described with reference to the accompanying drawing showing, by way of non-restrictive example, a possible way of carrying out the method of the invention.

Figures 1-3 show the different steps in carrying out this method,

Figure 4 is a top view of a product produced by this method, and

Figures 5-8 show several possible embodiments of a tool for carrying out the method according to the invention.

Figure 1 shows, in section, a piece of metal 1 with a hole 2 as is well known in setting techniques. This hole 2 comprises, near the surface of the piece of metal 1, a conical seat 3 and a cylindrical part 3. As

can be seen, the conical seat 3 on which the stone is to rest is a very short distance, perhaps 0.1 to 0.2 millimeters, away from the surface of the piece of metal 1.

Figure 2 shows the stone 5 placed in the hole 2 before setting has commenced. Figure 2 shows a tool 6 approaching in a direction perpendicular to the surface of the piece of metal 1. In figure 2, the tool 6 illustrated has a conical end terminating in a tip 12.

Turning to figure 3, the tool can be seen to be applied to the surface of the piece of metal 1. During this application of the tool, the material is pressed out away from the tip of the tool 6 and the material constituting the piece of metal 1 is therefore displaced to form a lip 8 over the girdle 9 of the stone 5 as it sits in the hole. This lip 8 therefore serves to immobilize the stone 5 in its hole.

The next step in the method is to use the tool 6 to form new indentations 11 in that surface of the piece of metal 1 which is bounded by the stones 5.

Referring to figure 4, this shows the multiple indentations 11 produced in the inter-stone surfaces. In the illustrative embodiment depicted, these indentations 11 have facets - four facets in this case. The indentations 11 situated adjacent to the stones hold the stones in place, while the function of the other indentations 11 is to reflect the light.

Figures 5-8 show several embodiments of the tool. These embodiments, though non-restrictive, nonetheless all have the common feature that the end of the tool consists of a tip 12 at its end. This tip 12, applied perpendicularly to the surface of the metal, displaces even the hardest metal to form a lip 8.

Figure 5 shows a tool with a pyramidal end.

Figure 6 shows a tool with a tetrahedral end.

Figure 7 shows a tool with a conical end.

Figure 8 shows a tool whose end has four facets.

The process thus described has many advantages. It can be used to set stones in an extremely hard metal, such as titanium, because the tool used to deform the metal and create a lip over the girdle of the stone acts perpendicularly to the surface of the piece of metal that is to hold the stones.

Moreover, the fact that the tool has an end which will give the indentation a smooth surface procures an additional effect in that the indentation that holds the stone in place also reflects the light.

Adding more indentations of this kind between the stones creates a reflective area between the stones which displays their luminosity to advantage. The dull area that occurs in pavé settings created by conventional techniques disappears in the invention and is replaced by a light-reflecting area.

Finally, the action of the tool produces no burring, with the result that the jewel or timekeeper set in this manner will not snag or catch.

Another advantage of the method according to the invention is that it can be used to set stones in an internal surface or in an uneven surface.

Lastly, the surface set by the method according to the invention has a continuous appearance which causes the

set stones to appear as if aligned in rows and columns.

It goes without saying that the invention is not limited to the embodiment described above by way of example. On the contrary, it encompasses all embodiments of the invention.

For example, other shapes of tools may be envisaged. It is obvious of course that all types of precious, semiprecious or synthetic stone can be set by this method.

It will also be understood that, though the method is particularly suitable for setting in hard metals such as titanium, it can also be used in metals such as gold, silver or steel.